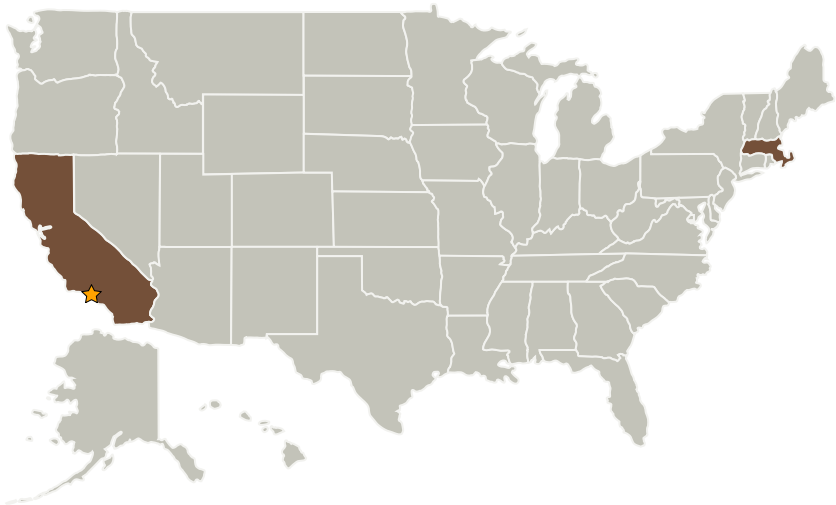
Rapid Robot Design Validation, Phase II

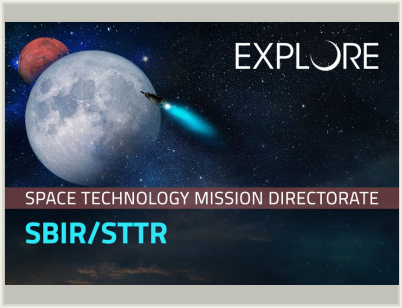
Completed Technology Project (2005 - 2007)

Project Introduction

Energid Technologies will create a comprehensive software infrastructure for rapid validation of robot designs. The software will support push-button validation through existing commercial design software, such as SolidWorks. After validation is invoked through the design-tool GUI, the robot design data will transfer to separate networked or integrated software for analysis. An interface will be provided for communicating with commercial third-party analysis software, and Energid will also provide its own analysis software through the common interface. Energid's own analysis software will allow interactive placement of any number of end effectors on any number of mobile mechanisms, each with any number of kinematic links and branches. The articulated-motion control system and joint-controllers will be automatically generated from the robot description. For both control and simulation, generic multi-degree-of-freedom joints will be supported. Energid's software will provide dynamic simulation, including articulated-body, actuator, control system, impact, and terrain dynamics. The automatic control system generation and dynamic simulation will support parametric, Monte Carlo, and parameter-optimization analysis. The software will allow physical descriptions, end-effector descriptions, control algorithms, and the environment to be arbitrarily exchangeable as modules through the Extensible Markup Language (XML) and Dynamic Link Library (DLL) plugins. A new XML-based language, ROAMEL, will support configuration, data transfer, and exchange.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Energid Technologies	Supporting Organization	Industry	Cambridge, Massachusetts

Primary U.S. Work Locations	
California	Massachusetts

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.5 Thermal Control Analysis